Geology Today

Index 2001

Acasta gneisses 97
  oldest known components of 96
Acrodus anningiae 112
active ice recession 25
Adam, in New Red Sandstone (Anish Kapoor) 200
Advances 19–21
Afghanistan, destruction of Buddha statues 85,*85*
Africa
  azurite and malachite 155
  importance of fertile soil 225
African Craton, position of European Lower Devonian realm near 177–8
Agassiz, Louis, named fossils after Mary Anning 112
aggregates
  Going for the hard stuff (let.) 94–5
  production reflects national policies 171–2
  where now? 7–8
  see also quarry, rejected
Agriculture, Board of, uninterested in Farey's geology 63,68
airborne particulate matter, UK standard for 32
AITKENHEAD, N., Norfolk: a geological puzzle 212,*212*
Akilia Island, west Greenland 183
Alatau Mountains, Tian Shan range, source of debris flows 169
Albertosaurus 211
alligatoroids 76
Almaty, Kazakhstan, landslide protection 169–70
  dam later enlarged 169–70
  debris flow protection works below Medeu 170,*170*
  rockfill dam to catch debris flow material 169
Alupka, Crimea, historic house in danger from geological hazards 4
amateurs, in British Geology (meeting) 88–9
American Geophysical Union, award winners 89
ammonites
  drinkable! 87
  in mud springs 19
  North Mendip 28
  Russian 164–5
Amudarya (river)
  largest take by Turkmenistan not Uzbekistan 222
  supplying irrigation water 219–20
  wetland delta 219
    now dried up 221
Analcime (Minerals explained) 236–9
  curation 239
  distinguishing features 237
  environment 237
    a low-temperature mineral 237
    primary–secondary distinction not easily resolved 237
  H-type and X-type 237
  occurrences 238
  structure and chemistry 236–7
    forms continuous series with pollucite 237
    symmetry 236
  uses 238–9
    as geobarometer and chronological–climatological marker 239
    industrial applications 238
  zeolite and/or felspathoid 236
analcimolite 236
Ancaster stone, 'the wrong kind of stone' 125
ANDREWS, P.
  hydrothermal blowout in New Zealand 10–11
  New Zealand: tectonics and rock haiku 129–30
angular debris trains 27,28
Anhanguera piscator 18–19,*19*
annelid worms, Ediacaran biota 117,*120*
Anning, Mary 110,111–12
  discoveries 111
  mixed freely with leading scientists 112
  mother of palaeontology 111,*111*
  self-educated and highly intelligent 111
  successful fossil seller and foreshore guide 112
annivite 78
Anomalocaris canadensis 232
Antarctica
  largest intraplate quake in history 15–16
    attributed to post-glacial rebound 217
  palaeontological island visits 159–60
Anteosaurus 37
apatite, dating of, and age of Isua graphite 184
aptosaurids 76
aquifer, underlying the Egyptian western desert 101
Arabian Gulf coast, Miocene links with Africa and Pakistan 158
Arabian Shield 160
Aral Sea, the demise of, an environmental disaster 218–34
  Amudarya and Syrdaryareduced flow from 219–21
  ceased to be a climatic stabiliser 221
  the future 224
  health problems from contaminated soil/dust 221–2
  the Large Aral
    most likely future is further shrinkage 224
    political problems 222
    possible one-off bonus from Tajikistan 224
    salinity 221
  levels have always fluctuated 218–19
  mismanagement of excess water from Khiva Basin irrigation channels 221
  salinity of 219
  Sea shared by Kazakhstan and Uzbekistan 218
  the shrinking sea 220–2
  the Small Aral
    appears to have a sustainable future 224
    collapse of commercial fishing and land-based industry 223
    prevention of overflow to Large Aral 220,223
    took most of remaining Syrdarya flow 221
  Soviet cotton 219–20
  Vozrozhdeniye Island, anthrax spores buried there! 224
  windblown soil contaminated by salt and chemicals 221
Archaean, reducing terrestrial environment 140–1
Archosauria 71–2
Arctognathus 36
Argentinosaurus 83
argentotennantite 78,79
Argile à silex (clay-with-flints), formation of 227
Arkwright village, Derbyshire, removed to safer site 9
Arran, Isle of, a student learning ground 47
arthropods 195
  Burgess Shale 232,233,235
  Ediacaran biota 117,*120*
As others see us 8
asbestos, development of cancers or asbestosis 33–4
asteroids 97
  Eros 46–7
  impact at the K/T boundary 98
  potentially earth-impacting
    research into 202
    search for 6
Asteropyge 177
astrobiology
  European Astrobiological Network 127
  involves all aspects of life beyond Earth 126–7
Atlantosuchus, jaw length 73
Aurelia aurita 119
Australia, analcime 238
Australopithecus afarensis (Lucy) 43
Ayers Rock 42
Azurite and malachite (Minerals explained) 152–6
  alteration 155
  chemistry and structure 153–4
  classic localities 155–6
  cleavage 154
  curation 156
  distinguishing features 154
  faking 156
  for ornamental purposes 156
  physical features 154
  precipitation of 153
  product of supergene activity 153
  symmetry 154
  uses 156
    for blue and green pigments 156
    as rich source of copper 156
Back-covers
  Alabama Hills, California 5Cov.
  folds of Millook Haven 2Cov.
  Macalube mud volcano, Sicily 6Cov.
  Mam Tor landslide 4Cov.
  View from Dead Horse Point 1Cov.
bacteria
  calcinogenic, growing marble 85
  unicellular 115
bacterium 2-9-3, revived after 250 million years 6
Bahariasaurus 162
Bahariya basin, *Paralititan* (large dinosaur) 102
Bahariya oasis 101
  new dinosaur discoveries 162
Baie du Mont-Saint-Michel special map sheet 91–2
  accompanying memoir 92
  depiction of Quaternary deposits and Solid formations 92
  used to improve tidal flushing 92
Balleny Plate, and the Antarctic large earthquake 16,*16*
Baltic Exchange, rebuilt, choice of marbles for 125
Baltica, movement of 150
banded iron formations, and palaeoenvironment, a problem in petrogenesis 140–3
  banding, macrobands, mesobands and microbands 140,*141*
    lamination may result from post-depositional alteration 142
    layering seems to be primary (or synsedimentary) 142
    magnetite layers 141,*141*
  classification
    Algoma-type 140,141,*141*
    Superior-type 140,141
  considered to be chemical precipitates 140
  influence of life 142
  magnetite as an original depositional component 141–2
  microstructure 141–2
  Precambrian environments 140–1
  secondary processes 142
  uniformitarianismm 142–3
Banks, Sir Joseph
  patron of John Farey 59,61,62,68
  and William Smith 40
Barberenasuchus brasiliensis (sphenosuchian) 73
barchans, Kharga oasis 103–4,*103,104*
  migration may bury houses and cover roads 103,104,*104*
  pattern of constantly changing 104,*104*
barnstorming, in the Yorkshire Dales 164
Barrule Formation 106,108
Baru darrowi (crocodyloid) 75
barytes, drop in production 171
basalt querns 209,*209*
basalts
  basalts and yet more basalts 176–7
    Harrat Ash Shaam, in context 177
    interrupted sequence may correlate with stages of the Dead Sea Rift 176–7
  pillows in Isua Greenstone Belt 181,*182*
BATCHELOR, R.A., History: a Geological Wall and others 210–11
Bateig Fantasia, echinoid burrows at Brent Cross 229–30,*230*
BBC
  Live from Dinosaur Island
    based on fantasy 166
    and cliff erosion? 164
  to licence *Walking with Dinosaurs* brand to theme parks 163
Bedford, Francis 5th Duke of, association with William Smith 40
Belemnospia 111
Belemnostmus anningiae 112

def. = definition; let. = letter; figures and tables in italics

Benett, Ethelred, first lady geologist or collector par excellence 192–4
  ability to relate to laymen and professional geologists 193
  became expert in fossil sponges 192,*193*
  collection of Wiltshire fossils 194
  contribution to Sowerby's *Mineral Conchology* 192
  generosity and charity of 193
  growth of interest in palaeontology and stratigraphy 192
  Honorary Doctorate of Civil Law at St Petersburg University 193
  interest in natural history 192
  painting of County Limerick meteorite 194
  recent work in Philadelphia on her fossil collection 192
  responsible for first measured section at Upper Chicksgrove Quarry, Tisbury 192–3
  seen as true biostratigrapher 194
  significant contribution to Wiltshire geology 193,194
BENNETT, M.R. *see* HAMBREY, M.J. *et al*
Berriasian Stage 135
BIFs *see* banded iron formations
binnite 80
biomedicine for Mars 8
biomimetics 84
biomineralization 231
bioturbation, by echinoids 230,*230*
birds, theropod ancestry of 139,*139*
Birling Gap, saved after Public Inquiry 167–8
Black Hills Institute of Geological Research, home to *T. rex* Stan 8
Black Mesa coal deposit, pyrite discs within fracture zones 98,*100*
blackdamp
  listing should be similar to that of phenols and gasworks residues 9
  may make brown-field sites unusable 10
  seeping upwards from old mine workings 9
BLAND, B.H., de GILBERT, J.M., and GOLDRING, R., A fossil whodunnit 220–30
Blue John, *Derbyshire Blue John*, T.D. Ford 48
Borrowdale Volcanics 175
Bottled geology (Branch line) 239–40
  advertising language 239–40
  labels, strange ideas on mineral content 239–40
  Sussex Spring Water, a geological explanation 240,*240*
boulders, as spectacular travel experiences 42–3
BOYLAN, P.J., Behind the scenes at the British Museum (let.) 14
Branch Line 40,157–60,199–200,239–40
Brent Cross, burrowing echinoids 229–30
Bretesuchus bonapartei (sebecosuchian) *73*
Briançonnais Nappe 145
Bridgewater Treatise (last), Buckland, illustrated by Mary Morland 112–13
Briefing 2–8,42–8,82–9,122–5,162–6,202–7
Britain, High-Arctic glaciers as analogues for glacial landform development 24–8
  debris-entrainment and deposition by glaciers 26–7
  glaciers of Svalbard 25–6
  implications for reconstructing past glacial environments 27–8
  likely that last glaciers did not stagnate *in situ* 28
British Geological Survey
  Mapping: times are changing 133–4
    changes in conventional sheet maps 133
    drift and solid versions on same sheet 133
    sheets 15W New Cumnock and 67 Stonehaven compared 133–4
  professional women in 110
British Museum, Portland Stone row (let.) 14
Broken Hill, New South Wales
  azurite and malachite 155
  tetrahedrite as a primary Ag-rich mineral 79
Brora, Farey and the coal deposits 67
BRUMHEAD, D., Geology trail: Styal Country Park, Wilmslow 212–13
bucky balls 14–15,20
  see also fullerenes
Bueno Retiro porcelain, formula rediscovered 85
building stone, spot the oyster (Somerset House) 134,*134*
'bullet theory' (let.) 14–15
BUREK, C.V.
  The first lady geologist, or collector par excellence? 192–4
  Where are the women in geology? 110–14
Burgess Shale biota (Fossils explained) 231–5
  biomechanical significance of 'mineralization' 231
  the biota 233–5
    arthropods 233,235
    depositional environment 233
    non-arthropods 235
    unusual preservation of unmineralized tissues 233
  influence of change in hydrosphere and atmosphere 231
  probably a typical mid-Cambrian fauna 235
  Problematica 231
  selective advantage 233
  significance 235
Burgessia bella 232,233,235
Burlington Slate 175
BURNETT, D. *see* FORD, T.D.
Burra Burra mine, South Australia, malachite 154,155
burrowing, by echinoids 229–30,*229*,*230*
Burtness Comb, Lake District, impacts of possible lightning strike 213–14,*213*
  depression and displaced boulders *213*,214

calcretes 227
Caledonian Orogeny, Acadian phase 109
caliche 227
calving, of some Spitzbergen glaciers 25
Camarella 150
Canada, analcime 238,*238*
Canadaspis perfecta 232,233,235
Canadia spinosa 232
Canadian Journal of Earth Scientists, W.G. Caldwell honoured by a Special Publication 132–3
  underlying theme, 'Impacts and Mass Extinctions 133
Canary Islands, explosive disintegration of Cumbre Vieja, tsunami to hit Britain 202
Carasstus, and a modern fake 53,53
carbon dioxide, drives Crystal Geyser, Utah 22,23
carbon isotopes
  an understanding of 185B
  evidence for early life at Isua 183–4
Carboniferous Limestone 94–5,175
Carboniferous Period
  importance of fertile soils 225
  presence of a giant Pacific mantle plume 20
Carcharodontosaurus 162
carcinogenic materials, quartz and cristobalite 34
CARPENTER, S., Excavating a vertebrate-bearing horizon in the Upper Triassic sediments of North Mendip 29–32
Caudipteryx 139
Caveat emptor – fake fossils from the Far East 52–8
Cavinh Complex, Vietnam, Archaean rocks 214,*214*
celebrity animals 43
Chad, Lake, shrinking, more sediments exposed 122
chalk pinnacles, white desert of Farafra 102–3,*102*
  karst features 102–3
Chalk, the, clavagellid tubes and burrows 178–9
Chandler wobble, explanation for 2–3,*2*
Charnia masoni 116,117
Charnodiscus concentricus 116,117
Chenaillet Unit 146
chert bands
  in BIFs 141,*141*
  Isua rocks, partially altered to carbonate *183*,184
Chessy Mines, Lyon, azurite and malachite 155
China
  Asian relatives of *Diplodocus* 159
  Chinese Academy of Sciences to boost Earth-science studies 6–7
  continuation of age-old tradition of faking 52–7
  different length legs a problem 166
  gigantopterids found 82
  loess deposition-soil formation sequence 227
  Shandong Province, important palaeontological site saved for research 86
  ultra-high-pressure metamorphism in Dabie Mountains 69–71
    more than one cycle of ocean growth and subduction suggested 71
china clay, rights to mine on Dartmoor renounced 164
Cinder Bed 93,94,135
clavagellids, borers and burrows in chalk matrix 178–9
clay jars and amphorae, Holy land 209,*210*
'click-workers' required, to analyse Martian craters 127
cliffs, offshore photography of (let.) 137–8
climate
  10,000 years ago in Britain 28
  and the Egyptian oases 101
  past, reconstruction from pedogenic features 226–8
  and soil formation 226
Cloudina 115
cluthalite 236
cnidarians, Ediacaran biota 115,*116*,117
  colonial *116*,117
coal swamps, reducing conditions in 179
coastal erosion
  Lyme Regis, geological injustice 45
  managing retreat at Selsey (West Sussex) 85–6
  Medmerry Beach, West Sussex 45
  monitoring coastal crumbling in Filey Bay 205
  our unstable coastline 125,*125*
  retreat of white cliffs of Normandy 204
  rock revetments refused at Birling Gap 167–8
  White Cliffs of Dover disappearing! 84
Cockermouth, Cumbria, street geology *12*
coesite, characteristic of UHP metamorphism 70
colluvium, defined 226
Comahuesuchus brachybuccalis 75
cometary impact, and the Permian Mass Extinction Event (let.) 14–15
comets
  and life from space 49
  organic material from reaching Earth 46
  see also snow comets
Community 7–8,47–8,88–9
compression Manx and Dalby groups 109
Conservation
  Birling Gap saved after Public Inquiry 167–8
  conflicts of interest 207–8
continental crust, may be carried into mantle by subduction 70
continental drift
  contribution of Arthur Holmes 129
  and the Falkland Islands 129
  similarity of plant and reptile assemblages in southern continents 149
Coral Rag, confined groundwater from 19
core, Earth's
  composed mainly of iron 96
  S most likely light element in 100
Corrections 8
Correspondence 13–15,93–5,135–8,175–6
cosmic ray, very powerful, detected 128
cotton
  irrigated, using Amudarya and Syrdarya water 219
  plans to expand in Uzbekistan! 222
Countryside and Rights of Way Bill, implications for geologists 168–9
Creg Agneash/Mull Hill Formation 106
Creggan Mooar Formation 105
  protolith coticules 108
Cretaceous
  late Cretaceous gap
    appears to exist 98,99
    Hell Creek myth destroyed 16–17,*17*
Crichton's ankylosaur 43
cristobalite, toxicity of 34
Crocodilia, inconsistent usage 72
Crocodilians (Fossils explained) 71–7
  ability to lunge out of water for prey 72,76
  belong to Archosauria 71–2
  diversity 71,74–6
  the eusuchians 76
  lifestyle and behaviour 76–7
  modern, relatively recent evolution of 72
  morphology 71,72–4
  social behaviour 76
  what's in a name? 72
Crocodyliformes 72,72,74
crocodyloids 76
Crocodylomorpha 72,*72*
Crocodylus niloticus
  jaw *73*
  tolerant of its kind 76
Crocodylus porosus (saltwater crocodile) 71,*72*
  highly pugnacious 77
'Crocodylus' robustus 74
Croft Quarry, Leics., analcime 236,238
Crozant granite 191
  foliation 187
cryoturbation 227,*227*

Crystal Geyser – Utah's cold one 22–4
  decline in activity 24
  eruptions, described 22–3
  historical changes 24
  source of the carbon dioxide 23
  travertine 24
Culver Cliff, viewed from the sea 138,*138*
Cumbria, RIGS pamphlet, *Ancient Rocks in South Cumbria* 175
Curry Fund, grant for systematic excavation at Sutton Hill Quarry 30–2
Cyberpompeii 3
Cyclomedusa davidi 117,*118*

Dabie Mountains, China, ultra-high-pressure metamorphism 69–71
  garnet with coesite inclusions 70,*70*
  mechanism for uplift of UHP rocks 70,*71*
  other UHP minerals present 70
  presence of eclogite 69–70
  tectonic implications70-1
  UHP rocks may have been in mantle for whole Wilson cycle 71
Dakhla oasis 101
Dalby Group
  sedimentation of 108–9
  stratigraphy 107,*108*
  structure 109
Damesops sheridanorum (deformed) *148*
Dartmoor, planning rights to mine china clay renounced 164
The Dating Game: One Man's Search for the Age of the Earth, C. Lewis 128–9
Dating of the Harrat Ash Shaam Basalts, North East Jordan 176–7
de GILBERT, J.M. *see* BLAND, B.H.
debris, transport by glaciers 26
debris flows, Alatau, most mobile type 169
debris-entrainment, and deposition by glaciers 26–7
  entrainment by thrusting 27
  intense folding of basal debris layer 27
  longitudinal foliation 27
  primary stratification, often folded 26
Deccan Traps 15
deformation
  Isle of Man 109
  Plateau d'Aigurande, France 187–8
Deinosuchus 76
denudation concept, Farey 65
Derbyshire
  Farey's time in 61–7
    report for Sir Joseph Banks 62
    section across the Peak District 62,*63*
    work with White Watson 62
  section from Ashover to Lincolnshire coast at Trusthorpe 62,*64*
Derbyshire Blue John, T. D. Ford 48
Devensian glaciation, extent in Britain 24–5
Devil's Chimney, Beachy Head, weather blamed for collapse of 122
Dhoon anticline 109
diagrammatic sections *107*
diamonds, examining provenance of to stop diamonds-for-arms trade 44
Dickinsonia costata 117,*120*
Dicrotendipes thanatogratus 43
diesel exhaust particulates, form spherulites 32–3
differential satellite radar interferometry (DIFSAR), for determining deformation 16
Dimetrodon
  arched skull 36–7
  pelycosaur from Texas red beds 38
Dinas Dinlle, example of glacial thrusting 28
dinocephalians, pachyostotic (thickened) skull bones 37,*37*
'dinosaur bridge', design for 84,*84*
dinosaurs
  an almost complete titanosaur constructed 203,*203*
  another graveyard, Patagonia 83,*84*
  BBC, Extreme dinosaurs 87
  dromaeosaurid, filamentous integumental appendages 139,*139*
  fossilized 'titanosaur nursery' 203–4
  mature, non-avian, size of 21
  mobile model *T. rex*, no planning permission required 163
  Natural History Museum exhibition 83
  new discoveries at Bahariya oasis 162
  and a new mood 46
  one named after another! 43
Diraphora bellicostata 234
disasters
  environmental, demise of the Aral Sea 218–24
  geological 202–3
  slab-edge type earthquake attacks Hiroshima 90
disasters up, deaths down 43
dolins, in dolomite/dolomitic limestone and gypsum karst 17
Doliosaurus 37
DONOVAN, S.K.
  Eurypterids (Fossils explained) 195–9
  and LEWIS, D.N.
    The Burgess Shale biota (Fossils explained) 231–5
    The Ediacaran biota (Fossils explained) 115–20
Douglas syncline 109
'dragon of the air', new and giant 18–19
drilling research vessel, new 124
dry valley, Birling Gap 167
DUBBIN, W., Soils, past and present 225–8
Dudley Canal, encrusted brickwork 207,*207*
Dunkirk, back to, creation of misinformation (let.) 13
duricrusts 226–7
duripans 227
Durlston Bay, Purbeck section, magnetostratigraphy of 136
Durlston Formation 93,94

Earth
  a differentiated body 96
  how to prevent overheating of 165–6
  oldest known rocks 96
  prehistory of 126
earthquakes
  Antarctic, largest intraplate quake in history 15–16
    attributed to post-glacial rebound 217
    possible mechanisms 16
  Assam 1897, re-evaluated 216–17
  Gujurat 2001
    foreign seismologists allowed to participate in research 86
    great devastation but little despair 123
  interesting quake-related experiment in schools 204
  large, unprepared for 202
  minor, beneath Mount Fuji 84
  New Madrid, Missouri 1811-12 earthquake swarm 217
  Quake rocks Devon, budgie injured! 162,165
  research with University of California's updated centrifuge 3
  Sierra Madre 45
  slab-edge type attacks Hiroshima 90
  Whittier Narrows 45
Eastern Avalonia 108
Echinocardium cordatum, meniscate backfill *229*
Echinodermata 229
eclogite
  can be both igneous and metamorphic 70
  suggests high-pressure metamorphism 69–70
ecosystems, soils occupy a central place in 228
Ediacara flindersi 117,*118*
Ediacara Hills, South Australia 115
Ediacaran biota (Fossils explained) 115–20,231
  affinities controversial 115
  all multicellular 115
  concept of a late Precambrian biota 119
  dominated by radiate organisms 119
  filter feeding or direct absorption of nutrients 119
  global distribution of 119
  international 115
  nature of 117–19
  organisms of
    alternative theories 117
    traditional interpretation 115–17
  soft-bodied organisms 115,119
Egypt
  fossil discoveries at Bahariya Oasis 162
  Western Desert, pinnacles and barchans in 101–4
El Penol, Colombia 43
El Salvador earthquake causes landslide 87,*87*
elements, relative abundances in the sun 96
End of the Twentieth Century, basalt columns (Joseph Bueys) 199–200
Endpieces 8,48,166
energy budget, changing 172
English Heritage 170,207
  industrial conservation sites now part of remit 208
  lacks knowledge of geological SSSIs and RIGS 208
  no geologists on survey and report teams 208
English Nature
  appointment of geologist to 47
  much work for geologist Malcolm Hart! 170
  objected to rock revetments at Birling Gap 167–8
  Pevensey Levels, interface with English Heritage 170
  strong on biological science, reluctant to introduce geology 170
  work of 47
Entrada Sandstone, Crystal Geyser sited in 22
erratic distribution, and the Millennium Preseli bluestone 12–13
  erratic errata (let.) 93
eruptive/extinct, orator in print 179
Eryops, fake resembling original *Trematops milleri* restoration 55,56
ETHERINGTON, J., Erratic errata (let.) 93
Eudibamas cursoris, a speedy bolosaurid 21,*21*
eudnophite 236
eukaryotes 115
Europe
  astrobiological activities for the future 127
  work in mountain belts, aided by fossils 149
European Astrobiological Network 127
European Southern Observatory, Very Large Telescope (VLT) 126
eurypterids (Fossils explained) 195–9
  Eurypterus
    appendages 196,*196*
    body shape 195,196
    features of mesosomal segments *196*
  respiration, gill structures 196–7
  trace fossils and behaviour of eurypterids 197–8
Eurypterus remipes 195
Eusuchia (eusuchians) 72,75,76
event beds, and Ediacaran fossils 115
Excursion Guide (14) 143–8
exobiology *see* astrobiology
Exploring Geology on the Isle of Arran, C.J. Nicholas 47
  field exercises and their application 47
Extraterrestrial watch 49–51,126–8

fahlores (tetrahedrite group: Minerals explained) 77–80
  alteration 79
  chemistry 77–8
  curation 80
  distinguishing features 79
  environment 79–80
  faking 80
  forming today 80
  structure 78–9
  uses 80
  where to find 80
faking
  Archaeoraptor, the process revealed 82–3
  then and now 46
  see also fossils, fake
Falkland Islands, P. Stone and D. Aldiss 129
Farafra oasis 101
  white desert
    pinnacles 102–3,*102*
    towers, bases protected by talus aprons 103,*103*

Farey, John 40
A Farey story: the pioneer geologist (1766-1826) 59–68
achievements 67–8
activities after the *General Review* 67
at Brora 67
the budding polymath 59,61
in Derbyshire 61–7
and the Geological Society 67
introduction to geology 59
map of Ashover anticline 2(Front Cover),62
section from Ashover to Lincolnshire coast at Trusthorpe 62,64
the Wealden anticline section 60,61
apparently unaware of Hutton's work 65
concerned with plans for the Rotherhithe Tunnel 61
development of denudation concept 65
extended stratigraphic column down through the Carboniferous 63
General View of the Agriculture and Minerals of Derbyshire 62–3,65–7
and mathematics 61
meeting and friendship with William Smith 59
meeting with Jonathan Otley 67
speculation on folding 65
worked with Sowerby on *Mineral Conchology* 67
Farringdon, Berks, Chace Field flooding, remedial options 163–4
faults
Isle of Man 109
new, beneath San Gabriel Mountains, USA 45
seen by Farey in Derbyshire 65,66
feathers, origin and early evolution, a vexed question? 139
ferricrete 179
ferrous ions, persistence in Precambrian ocean and BIFs 141
field emission scanning electron microscope (FE-SEM), for single particle characterization 35
field emission scanning electron microscope (SEM), for single particle characterization 35
First lady geologist, or collector par excellence? 192–4
fish fossils, China
'authentic' fakes 52–3,53
enhanced and distorted 52
flash flooding, danger in Alps 44
flood-basalt volcanism 20
and end-Permian extinctions 98
floodplain blues, planning authorities ignore advice 5
flowering plants in the making 82
folding, and associated cleavage, Manx and Dalby groups 109
'foliation-parallel ridges' 27,28
foot-and-mouth pyres, excessive heat from 124
FORD, T.D.
Derbyshire Blue John 48
QUIRK, D., and BURNETT, D., The Manx Group of the Isle of Man 105–9
and TORRENS, H.S., A Farey story: the pioneer geologist John Farey (1766-1826) 59–68
FOREY, P.L. *see* MILNER, A.C. *et al*
fossil, fails to be elected US President 44–5
fossil bed, Sutton Hill Quarry 29
broken, rolled and abraded bones 31–2
depositional environment 31
Fossil Hall Bookshop, closing down 89
fossils
A fossil whodunnit 229–30
Clavigellidae tubes 178–9
commercial collectors and dealers 206
deformed, information from 146,*148*
fakes from the Far East 52–8
carved claws from Thailand 57–8
a Chinese amphibian from Texas 54–7
fishes 52–3
the Guizhou Dragon 53–4
materials testing 57
reptiles and amphibians 53
footnote on conservation 178
juvenile bird, regurgitated, Mesozoic 82,*82*
in mountain belts 148–52
trilobites from Morocco 177–8
underfoot 8,*8*
used to date mountain strata 149
Fossils explained 36–9,71–7,115–20,148–52,195–9,231–5
France, retreat of the white cliffs of Normandy 204
freibergite 78
French–Italian Alps, the Atlantic-type ophiolite, Mont Chenaillet (Excursion guide 14) 143–8
frigidite 78
fullerenes
at the K-T boundary 20
found in the Allende meteorite 20
in P/T boundary layers 98

gabbro, Mont Chenaillet 144,*144*,145
Gakkel Ridge, potentially active volcanoes on 138,*139*
Galapagos Islands, closely grouped active volcanoes 3
Galileo spacecraft, pictures of smaller Jovian moons 49,49
gas hydrates, a potential hazard 5–6
Gavialis gangeticus 73
gavialoids 76
General Review of the Agriculture and Minerals of Derbyshire, John Farey 62–3,65–7
attempt to classify faults 65,66
detailed geological map never published 65–6
incomplete draft found 66
memoir to accompany map also lost 67
puzzled by Charnwood Forest rocks 65
geoarchaeology of the Holy Land, the Bible Exploration Centre, St Albans 209–10
building stone quarried from underground 210
need for further information on geology and structure 210
Geodigest 15–21,96–100,138–9,176–9,214–18
geological hazards
and Crimean history 4
landslide protection 169–70
Geological Society
did not consider Farey worthy of membership 67
found his work too detailed and speculative 65
scathing of Farey's work 61
and William Smith's map 173
Geological Society of London, Mary Anning eventually made an honorary fellow 111
Geological Songs, Albert Ludford replies 130–1
geological SSSIs, can be over-ridden by archaeological site registration 168–9
The Geologist's Directory 89
geology
in charity shop art 5
in nineteenth century education 110
Geology trail, Styal Country Park, Wilmslow 212–13
geotourism, Hinboun River Cave, Laos 90–1,91,92
Ghard Abu Muhariq plateau 101
source of sand on limestone plateau 104
Gharial, extreme snout lengthening 73
Ghosts, Kilkenny Limestone (Anish Kapoor) 200
Giant's Causeway, theme park status? 202–3
Gibraltar, and the Neanderthal environment 157–8
gigantopterids, oleanane from 82
Gigantosaurus 83
Patagonia 5
giraudite 78,79
glaciers, high-Arctic, as analogues for glacial landform development in Britain 24–8
debris-entrainment and deposition by 26–7
glass spherules
at impact sites 15
in early Precambrian strata 15
GLASSER, N.F. *see* HAMBREY, M.J., *et al*
Glen Dhoo Formation 106
Glen Rushen Formation 106,108
Glion Cam Member 105
global warming, more of Lake Chad's sediments exposed 122
goldfieldite 78
GOLDRING, R. *see* BLAND, B.H.
gorgonopsians 36,36
able to tackle very large prey 39
ancient sabre-toothed 'ultracarnivores' 37–9
body form 38
inhabited southern Gondwanaland 39
jaw-closing muscle 38
later skull forms 39
skull 38,*38*
GOSNELL, R., Offshore cliff photography (let.) 137–8
Graham Island, underwater vandals 204
Granites are not diapiric!, support for no-diapir model (let.) 14
graphite
crystallites of and spherulites 33
Isua rocks, not directly dated 184
Great Hanshin Earthquake 90
The Great Wide Open: Panoramic Photographs of the American West, J.A. Watts and C. Bohn-Spector 164
Greenhill Common, mud spring at 19
greenstone belts, Archaean 139,140
greenstone provinces, Carboniferous accretionary complexes, Japan 20
Gryphaea, occurrence at height in Andes allowed correlation with European horizon 149
Guizhou dragon, faked 53–4,55
gypsum production 171

Hadrian, carving restored on Trajan Arch 123–4,*123*
Hadrian's wall, more uncovered 125
HAILE, N., Mary Morland (let.) 137
hakite 78,79
Hallucigenia sparsa 232,235
HAMBREY, M.J. *et al*, High-Arctic glaciers as analogues for glacial landform development in Britain 24–8
Hammersley Basin, is hydrothermal activity possible for BIFs? 142
Hanging Rock, Melbourne 43
HARPER, D.A.T., Fossils in Mountain belts (Fossils explained) 148–52
Harris, Isle of, superquarry rejected 6
health, affected by particulates 32
Helike, rediscovered 4
Hell Creek Formation
dinosaur myth destroyed 16–17
T. rex specimens 5
Helsby Sandstone 213
Hinboun River Cave, Laos 90–1,91,92
grading karst-style 91
originated as route following limestone fracture 91
river passage between two poljes 90
Hiroshima earthquake 90
History
aspects of Arthur Holmes 128–9
the father of English geology 172–4
a Geological Wall, and others 210–11
Holey war 185
Holmes, Arthur, aspects of 128–9
assessing the age of the Earth 128–9
and continental drift 129
The Principles of Physical Geology 129
Hornton building stone, disappeared 46
hot-spot basaltic isotopic signatures, diversity of 19
Hubble Space Telescope
capturing Jovian northern lights 49
pictures of Whirlpool galaxy (M51) 127,*127*
SN1987A, glowing gas ring round 50–1
HUDDART, D. *see* HAMBREY, M.J. *et al*
hummocky moraines
interpreted as product of ice stagnation 25
small, may be result of thrusting 28
hydrothermal activity, and BIF formation 142
hydroxyl radicals, and DNA damage 34
Hyla stingi 43
Hylaeochampsa 76

Iapetus Ocean 108
closed before Dalby Group deposition 109
transect across, Scandinavian Caledonides 150
Iceland
analcime 238
successful prediction of volcanic activity 87
ichthyosaurs
faked 46
Sutton Hill Quarry 30–1
swimming speed of 42
Ichthyosaurus communis 30
illitization, defined 226
illuviation, defined 226
Imbricate Belt, Isle of Man 109
impacts
Eocene, microtektites and microkristites 15
may have changed 15
In Sight of the Suture, Geological Society Special Publication 105
India
Cretaceous strata, Narmada Valley 158
relaxes rules for visiting seismologists 86
Indochina, sequence of geological events 214,*215*
Injebreck Formation 106
insurance premiums, higher in radon risk areas 9

International Ocean Drilling Programme (ODP), new drilling research vessel 124
interplanetary contamination 46
Ireland, azurite and malachite 156
iron isotopes, study of 185
ironstone layers 227
irrigation, by Soviet Union
  canal infrastructure falling apart 222
  evaporation and leakage of water from canals 219
  using water from Amudarya and Syrdarya 219
isotope mass fractionation 185B
isotopes, radiogenic and stable 185B
Isoxys acutangula 232
Isua Greenstone Belt
  age of 181
  BIFs, indirect evidence of biogenic activity in 142,*183*,184
  chemical signal preserved in graphite suggests biological origin 183–4
    geochemical methodology 185B
    Schidlowski's work 183–4,*183*
  clay-rich rocks 182–3,*183*
  evidence for early life 183–4
  original geological setting of 181–3
  testing claims for early life 184
  uncertainty over first formation of graphitic carbon 184
Isua supracrustal belt *see* Isua Greenstone Belt
Italy, analcime 238

Jamytius kerwoodi, stolen specimen recovered 3
Japan
  Mount Fuji, magma moving at depth 84
  Mount Oyama
    belching toxic gas into the atmosphere 86–7,*86*
    usually a steady emitter of magma 87
  new university museums showing fossil and mineral collections 125
  radwaste disposal problem 215
  slab-edge type earthquake attacks Hiroshima 90
  Sleeping restlessly in (let.) 137
JENKINS, I., Palaeozoic carnivorous reptiles (Fossils explained) 36–9
Jiufotang Formation 21
Jupiter
  display of northern lights captured 49
  moons 51
    demonstrating presence of water 49
Jurassic–Cretaceous boundary on the Dorset coast (lets.) 93–4,135–6

Karakum (Black Desert) 218
Karakum Canal 222
  likely failure would put water into Caspian catchment 224
  reached far into Turkmenistan desert 219
karst, the Yorkshire peril 17–18,*18*
Kazakh Landslide Protection Organization 169
Keichosaurus hui (Guizhou dragon), fakes of 53–4,55
Keristal Member 106
Kharga oasis 101
  migrating dunes of 103–4
  travertine banks 101
Kharga–Dakhla highway
  barchans visible from 103,*103*
  diverted in many sections 104,*104*
Kilcoe castle, plastered peach 124
Kilkenny Limestone, Millennium Bridge steps 174–5,200
Kimberella quadrata 118
KING, R.J.
  Analcime (Minerals explained) 236–9
  Azurite and malachite (Minerals explained) 152–6
  The Tetrahedrite group (fahlores) (Minerals explained) 77–80
Kongsfjorden, moraine complexes show signs of thrusting 27
Kongsvegen, surging glacier 26
Kronebreen, fast-flowing tidewater glacier 26
Kyzylkum (Red Desert) 218

Lady Port Formation 105
Laevitrigonia gibbosa, in Portland Beds 194
lagerstätten sites, Liaoning preservation of soft tissues 52
Lago-Nero-Replatte Unit 145–6
Lakesman terrane 108
Lambert, Aylmer Bourke 192
land movements in Britain, significant damage from 202
landslides
  British coasts 44
  caused by earthquake, El Salvador 87,*87*
  Mam Tor 4Cov,44
Langport Member, sublithographic limestones 29
Laos, geotourism and Hinboun River Cave 90–1,91,*92*
large igneous provinces (LIPs), ancient, have they left evidence of their existence? 20
Las Hoyas, fossil pellet, early Cretaceous 82,*82*
late Precambrian biota, concept of 119
Latvia, Old Red Sandstone 158
lead bioavailability, from dusts and smelter particulate emissions 33
leaves, why did they wait? 215–16
  delay probably due to late Palaeozoic drop in CO_2 216
  planate leaves on *Euphyllophyton bellum* 216
Leonardo davinci 43
Leptopterygius temirostris 31
leucite, pseudomorphed by analcime 237
LEVISTON, D., Holes at Lindal (let.) 94
LEWIS, D.N. *see* DONOVAN, S.K.
life, search for on other planets 185
life on Earth, searching for earliest record of 180–5
  Isua Greenstone Belt
    age of 181
    evidence for early life 183–4
    original geological setting of 181–2
    testing claims for early life 184
  other examples of early life 183
  so how good is the evidence? 184–5
limestone, hard, British, a fast depleting finite resource 95
Lindal-in-Furness, holes at (let.) 94
Lion Rock, Sri Lanka 43,*43*
Liostrea 31
lithologies, temporally restricted, obscure origins 142
Little Grand Wash Fault, and the Crystal Geyser 22
Lizard Complex, Cornwall, analcime 238
Loch Lomond Stadial
  effects in Britain 25
  'hummocky moraines' 25
  landforms had close affinity to Arctic glaciers 25
Loch Ness monster, mystery solved? 166
Lonan Formation 105,106,*108*
Lower Lias 29
Ludford, Albert, a response to Geological Songs 130–1
Lulworth Formation 93,94
Lycosuchus 36,39
Lyme Regis
  complete town at risk, attempt to pin the clay layers 45
  geological injustice 45
  Lyme Regis in danger (let.) 95
  The pinning of (let.) 175–6

magma outgassing 97
magnetite layers, in BIFs 141,*141*
malachite *see* Azurite and malachite (Minerals explained)
malinowskite 78
Mam Tor, Derbyshire, landslide activity 4Cov.,44
Man, Isle of
  excursion guides 105
  geological sketch map 105,*106*
  the Manx Group 105–9
mantle plumes 19
  and flood basalts 20
  large plume beneath Eifel Region, Germany 215,*216*
  search for smaller plumes 215
Manx Group 105–9
  deposition within Arenig period 108
  part of Lakesman terrane 108
  sedimentation of 108
    sediments derived from Midlands craton 108
  stratigraphy 105–6,*107*,*108*
  strike of units parallel to island axis 106
  structure 109
  see also Dalby Group; Peel Group
The Map That Changed The World, S. Winchester 172–4
  historical and geological errors 173
maps, Baie du Mont-Saint-Michel special sheet 91–2
marble
  Greek, originating quarries now identifiable 6
  grown by bacteria 85
Marche shear zone 187,188
Marrella splendens 232,233

Mars
  NASA requires 'click-workers' to analyse craters 127
  'Planet Mars – An Apology' 7
  shorelines turning into volcanic features 126
  yes, there could have been water on 96–7
Martin-Smith, M., You read it first in *Geology Today* (let.) 14–15
Masaikasaurus knopfleri 43
MASON, R., Ultra-high-pressure metamorphism in the Dabie Mountains of China 69–71
mass extinctions
  of invertebrates, Eocene-Oligocene boundary 21
  and the late Cretaceous gap 98
  Permian 97–8
Massif Central 186
massive sulphide deposits, banding similar to that in BIFs 142
Maughold Formation 106
Mawsonites spriggi 116
media, can we hope for accurate palaeontological reporting? 211–12
medial moraines 26,*27*
medusoids, Ediacaran 115,*116*,117
mega-tsunamis? 7
mekosuchines 75,76
Mekosuchus 76
mercury, in fahlores 80
Mesoeucrocodylia (mesoeucrocodylians) 72,74–5
  Dyrosauridae 75
metamorphic rocks, ultra-high-pressure (UHP) 69
metamorphism
  in the Alps 144
  regional and contact, Isle of Man 109
  retrograde, Plateau d'Aigurande 187
  UHP rocks have influenced ideas about conditions of 71
  ultra-high-pressure, Dabie Mountains of China 69–71
    tectonic implications 70–1
metazoans
  earlier faunas 231
  radiation in the early Cambrian 231,233
'Meteorite Lands on...' 128
meteorites
  characteristics of the Tagish Lake meteorite 20
  Martian
    ALH84001, evidence of previous life? 21
    Los Angeles 20
  sales and exchanges 162–3
  Shergotty, and water content of pre-eruptive Martian lava 97
  Yukon 2000, a carbonaceous chondrite 49–50
methane
  death by 5–6
  seeping upwards from old mine workings 9
metriorhynchids 73,75
Metriorhynchus (thalattosuchian) 73
MICHAEL, J.A., To encourage others (let.) 176
Micraster, no certain burrows seen in Chalk 229
microfossils, in pyrite 98
Microraptor zhaoianus 21,*21*
mid-mantle plumes 19
migmatites, Plateau d'Aigurande 187
Millennium Bridge
  the bouncing bridge, a pint-sized solution 174–5
  Kilkenny Limestone steps 200,*200*
MILNER, A.C., FOREY, P.L., and WILLIAMS, C.T., *Caveat emptor* – fake fossils from the Far East 52–8
mineralization, biomechanical significance of 231
Mineralogical composition of atmospheric airborne particulates 32–5
minerals, the statistics 171–2
Minerals explained 77–80,152–6,236–9
mining, the invisible killer 9–10
Mixopterus kiaeri
  inferred life orientations of 197,198
  poorly adapted for swimming 198
  trace fossil attributed to 197–8,*198*
Moho
  sudden jump in electrical conductivity at 97
  sudden small jump in seismic velocity at 97
molasse
  Caledonian, Scandinavian Caledonides 151,*151*
  definition 150
molecules, complex, creation of 49
molochitis 153

Mont Chenaillet. Atlantic-type ophiolite 143–8
  an excursion 144,146
    features to be seen 145–6
    maps and field guides 144
    route *144*,146–*7*,*147*
  at Montgenèvre 144
  comparison with standard ophiolite 144,*144*
  ophiolites in the Alps 143–4
  presence of ophicalcite 144
  rate of sea floor spreading and two different types of ophiolite 144–5
  upper nappe contains all rock types of the ocean crust 144
Moon, the, ready for building boom? 128
moons
  outer solar system, numbers of rising 51
  some with retrograde orbits 51
moraines, thrust
  many form within the ice 27
  result of propagation of compressive stresses 27
  some may form englacially 28
Morland, Mary 112–13
  accompanied husband on many trips 112
  and the Axminster landslip 113,*113*
  contributed to published works of Conybeare and Cuvier 112
  helped husband with literary work 113
  married William Buckland 112,*112*
  other duties as wife and mother 113
  Some correction (let.) 137
  supported husband by sketching and drawing for his publications 112–13
  unpaid tutoring and charity work at Islip 113
  work on marine zoophytes and sponges after husband's death 113
Moschops 37
Mount Roe palaeosol, indication of presence of methanotrophs 19
mountain belts, fossils in (Fossils explained) 148–52
  importance of fossils in mountain belt studies 148–9
  Scandinavian Caledonides 149–52
mud springs
  further examples 19
  Wootton Bassett 19
multitasking!! 7

NAISH, D., Crocodilians (Fossils explained) 71–7
Nanahughmilleria norvegica 151
Napier Complex 14
Naples, a sinking problem 16
Naraoia compacta 232,233
National Academy of Sciences, new Earth Science members 89
National Trust
  Birling Gap
    objected to rock revetments at 167–8
    offered to rehouse residents affected by erosion 168
  forsaking use of peat with some exceptions 123
Natural History Museum
  dinosaur exhibition 83
  disposal of Cold Bokkeveld meteorite (small piece) causes uproar 162–3
  mineral gallery 'hot spots' 83
  succumbed to pressure to go 'free' 124
  visitors down 46
Navajo Sandstone, source of water and carbon dioxide in Crystal Geyser 23
Neosuchia (neosuchians) 72,76
nepheline, alteration to analcime 237
Neptune, hotter than previously thought 127
nettosuchids 76
Neumania aff. *atlanticus 150*
New Madrid seismic zone
  associated with ancient intraplate rift zone 217,*217*
  Laurentide deglaciation cause of seismic events 217
New Zealand
  hydrothermal blowout in 10–11
  tectonics and rock haiku 129–30
    CNIPSE (Central North Island Passive Seismic Experiment 129–30
    Katikati, Haiku trail 130
Newbury Bypass, use of recycled materials for aggregate 171–2
News & Comment 9–13,90–2,128–34,167–75,207–14
Niarbyl Formation
  folded flagstones 105,*105*
  greywackes and mudstone 107,*108*
  mid to late Wenlockian 107
Niger, Cretaceous and Tertiary rocks of the Saharan margin 157
niobium
  at high temperatures partitions like vanadium 96
  refractory/lithophile but depleted in the mantle 96
Nisusia burgessensis 234
Norfolk
  the back-garden hole 85
  a geological puzzle 212,*212*
North China craton, Archaean ophiolite complex 138–9
North Mendip, excavating a vertebrate-bearing horizon in the Upper Triassic sediments 29–32
  fossil bed 29
  key observations 30–1
  opportunistic start 29–31
  see also Sutton Hill Quarry
North Pennines and Alston Moor, geology SSSIs vs. antiquities-style conservation 208
North Pennines AONB, whose rules take precedence? 209
notosuchians 75–6,75
Notosuchus terrestris 75
novels, engagement with earth sciences 7
NOWELL, D.A.G.
  Jurassic–Cretaceous boundary on the Dorset coast (let.) 93–4
  Maps: Baie du Mont-Saint-Michel special sheet 91–2
  The geology of the Plateau d'Aigurande, France 186–91
  on *The Map That Changed The World* 172–4
Nubian Sandstone aquifer 101
  fossil water, a finite resource 102

oases, Egyptian desert 101
  establishment of 101
  population pressure, and development of 101–2
  water resources 101
obuction, at destructive plate margins 143
Odontogriphus 235
OKADA H., disaster: slab-edge type earthquake attacks Hiroshima 90
Old Red Sandstone, fishy fauna, a strange coexistence in Lille 178,*178*
Oldham Fault *217*
  rupture of and Assam earthquake 216
oleanane, from Permian sediments 82
Olenoides serratus 233
Opabinia 235
Ophiacodon, snout of 37
ophicalcite 144
ophiolite complexes
  indicative of seafloor spreading and plate movement 139
  North China craton 138–9
ophiolites
  Alpine
    matched with those forming in Atlantic Ocean 145
    most altered by metamorphism 144
  fragments of oceanic lithosphere 143
  Pacific type and Atlantic type 143,145
Orion Nebula, contains planets without parent stars 126
osteoderms *see* scutes
Otozamites, Sutton Hill Quarry 30
Ottoia prolifica 234
Our World: Its Rocks and Fossils .... Mrs Wright 111
Ovatoscutum concentricum 118
oxisols 225

PAGE, D., Banded iron formations and palaeoenvironment: a problem in petrogenesis 140–3
Pakistan, early hominids in the Kashmiri Himalaya 159
palaeontology
  amateur, decline of 125
  Canada, palaeotologist honoured 132–3
  important site in China saved for research 86
  see also Anning, Mary; *Travels with Fossil Hunters*
palaeosols
  can expose cyclical nature of environments 227
  Mount Roe 19
  post-burial modification 227
  preservation of biological material 228
  and reconstruction of Earth history 225,228
  relic, buried and exhumed 226
  used to date past movements of San Andreas fault 228
Palaeosuchus (dwarf caiman) 71
Paralenorthis 150
Paralititan, Bahariya basin 102
Paralititan stromeri 162,*162*
Parastylonurus ornatus 195
  primarily a walking eurypterid 198
parazoa 115
Paris, ground deformation from underground railway construction 43–4,*44*
particle solubility and surface reactivity
  determined by mineralogy 32–4
  important in case of asbestos inhalation 33–4
particle surface properties, methods of study 35
particulates, airborne, mineralogical composition of 32–5
  experimental methods 34–5
  importance of mineralogy 32–4
Parvancorina minchami 117,*120*
Paurorthis 150
Peak Cavern, change of name 207
Peak District Mining and Quarrying, L. Willies and H. Parker 48
peat, disappearing from DIY stores, longer-term 122–3
Peel Group
  contains Wenlock Limestone pebbles 109
  probably Lower Old Red Sandstone 109
  and some problems 109
pelycosaurs 36
Permian, assemblage of predaceous specialized land carnivores 36–9
Permian–Triassic boundary, bolide to the fore 97–8
perthite exsolution 190
Perthshire, estate with own gold mine 206
Phacops vogeli 177,*177*
Philippine Sea Plate, and the Hiroshima Earthquake 90,*90*
Photographs, for the back-cover 9
photography, and a natural disaster 45,*46*
photosynthesis 184
  oxygenic 142
Phyllodontosuchus 74
piezoelectric effects, in quartz and cristobalite 34
Pilbara Craton, oil as fluid inclusions in hydrothermal barite 20
pillow lavas, Mont Chenaillet 144,*144*
Pinatubo, Mount
  botched attempt to construct overflow channel 205
  crater filling with water, disaster in the making 205
Pinnacles and barchans in the Egyptian desert 101–4
  migrating dunes of Kharga 103–4
  white desert of Farafra 102–3
Pisa, leaning tower stable at last 131–2
  stabilized by using subsidence to reduce tilt 131–2
planetismals 127–8
planets, without parent stars, Orion Nebula and star-forming region S106 126
plate collision, and UHP rocks 70–1
plate tectonics 149
  Archaean 138–9
  mechanism for far from certain 2
  theories tested by Bokelmann 2
Plateau d'Aigurande, France, geology of 186–91
  Creuse Valley 190–1
    Chambon thrust 190
    Crozant granite 191
    cut into Eguzon unit 190,*190*
    dolmen construction 191,*191*
    Lake Chambon, creation of 190–1
  deformation 187–8
  division into increasingly altered units 187
  Fougères unit, mineralization in 187,190
  Marche shear zone 187,188
  Montebas, kaolin quarry 190
  Pierres Jaumâtres 189–90
    differential weathering 189,*189*
    granite tors *188*,189
    part of Saint-Silvain leucogranite pluton 189–90
    periglacial activity *187*,188,189
  relief and structure 187
  transition from fertile Berry to the Marche with poor soils 187
plesiosaurs 30,31
plinthites 227
Pluto mission, Pluto–Kuiper express now back on track 50
plutons, leucogranite 187,189
PM10 particulate 32
Pocklington Canal, and its end in an SSSI 208
Pollingeria grandis 234
pollucite 237

Pompeii
the lovers rescued 56
perfume shop to be reopened 84–5
population expansion, Leeds, Yorkshire and the karst problem 17–18
poriferans 115
Portland Stone
boulder at Compton Verney for climbing practice 164
replaced by Anstrude, British Museum (let.) 14
Portreath Geology Guide & Illustrated Rock Trails ..., A. Marks 88.*88*
Portuguese Bend Slide, California
a lesson for Lyme Regis (let.) 95
not only failed pins 176
Postscript 207
Praecambridium 117
Pre-planorbis Beds 29.*30*
Precambrian, glass spherules from 15
predator traps 5
Preseli bluestone, erratic errata (let.) 93
Problematica, in Ediacaran and Burgess Shale biotas 231
Prohertzina jaw apparatus 233
prokaryotes 115
Prorastomus sirenoides 42
PROSSER, C., Conservation: Birling Gap saved after Public Inquiry 167–8
Protarchaeopteryx 139
protolith coticules 108
protosuchians 74
Pseudorhizostomites howchini 118
Pseudosubplanites grandis subzone 93.136
pterosaur, grows on the Isle of Wight 7
Pterygotus holmi 198
pubic aspiration 74
Purbeck Beds 135
Purbeck Limestone Formation 135
Purbeck Limestone Group, revised lithostratigraphy 93–4
Purussaurus 76
pyrite, discs of in coal 98.*100*

Qantassaurus intrepidus 43
quarry, rejected on Isle of Harris 6
Quarry Bank Mill, Styal, geology trail 212–13
background to leaflet 213
quartz and cristobalite, surface properties linked to toxicity of 34
QUIRK, D. *see* FORD, T.D.
Quote-unquote 46–7,87–8,125,165–6,206–7

radiation, early Cambrian 231,233
radioactive waste, disposal problems
Japan 215
USA 205–6
RADLEY, J.D., Juarassic–Cretaceous boundary, more on (let.) 135–6
radon, occurrence in built-up areas 9
Rainier, Mt, USA, past collapses and future threat to densely populated areas 138
Rangea 117
reptiles
and amphibians, Far East fakes 53,54,55
Palaeozoic carniverous (Fossils explained) 36–9
earliest specialized carnivores 36–7
gorgonopsians 37–9
replacements and evolutionary patterns 39
'terrible heads' 37
where to see Permian carnivorous synapsids 139
see also Crocodilians (Fossils explained)
research centres/bases, Svalbard 26
retrocharriage 145
Rhodes Formation 230
rights of way, need for redesignation 168
RIGS, another hit from Cumbria 175
ROBINSON, E. 207,*207*
on Birling Gap 168
Bottled geology (Branch line) 239–40
Geological travellers to distant lands (Branch Line) 157–60
The Tate Modern as geology (Branch Line) 199–200
William Smith's friends (Branch line) 40
ROLLINSON, H., Searching for the earliest record of life on Earth 180–5
Rome, subsidence a severe risk for many ancient monuments 123
Roni marble, savings by shipping direct 166
Rosetta Stone, not untouchable 7
Rotarua, New Zealand
spectacular eruption of mud-pool, Kuirau Park 10–11
Warakei thermal valley, drop in small lake water level 11
ROTHERY, D., Sleeping restlessly in Japan (let.) 137
Royal Society, Earth scientists as Fellows 89
Russia
analcime 238
theft and sale of fossils from museums continues 164–5
Rutrumella implexa 150

St Andrews, the Geological Wall 210–11,*210,211*
St Bees, example of glacial thrusting 28
St Helens, Mount, post-eruption sediment fluxes 17
San Andreas Fault, past movements dated using palaeosols 228
sand dunes *see* barchans; seif dunes
sand-blasting, of chalk pinnacles 102
sands and gravels, iron-cemented 179
sandstones, Manx Group, deposited from turbidity currents 108
Santana Formation
flying reptiles 18
fossil fish 18
new specimen *Anhanguera piscator* 18–19,*19*
Santon/Ny Garvain Member 106
sauropods 83.*84*
Scandinavian Caledonides, fossils in 149–52
constructed during a Wilson Cycle 150
development of molasse basins 151,*151*
fossil biotas and tracking of developmental changes 151–2
Hirnantia brachiopod fauna (late Ashgill), appearance of 151
Holorhynchus brachiopod fauna (mid-Ashgill) 151
Lower Allochthon, Baltic affinities 150
Middle Allochthon, Precambrian basement rocks 150
nappe emplacement, timing of 150
Oslo Region, evidence for early encroachment of nappe complexes 151
Ringerike Group 151,*151*
Upper Allochthon
basement rocks with Laurentian affinities 150
marginal Laurentian setting, arc-related succession 150
Otta Conglomerate, brachiopods, mix of Baltic and Laurentian taxa 150,*150*
Toquima–Table Head faunas 150,*151*
upper part with Trondheim region faunas 150
scanning electron microscope (SEM), for single particle characterization 35
schwatzite 78
Science 2–3,42,82–3
easy 160
low standing of in nineteenth century 110
Scotland, analcime 238
scutes, crocodilian 73–4,*74*
Scylacosaurus 39
sea cows *see* sirenians
sea floor spreading rates, and ophiolite types 144–5
sea-pens 115
sea-urchin burrows 229
seafloor vent systems, modern, generating oil 19–20
Seaford to Beachy Head SSSI, interests at Birling Gap 167
SECRETAN, F.
Where are the women in Geology? (let.) 136
reply, C. Burek 136–7
sediment liquefaction, New Madrid, Missouri 217
seif dunes, Kharga oasis 103,104
seismic events, Barents Sea, and destruction of the Kursk 206
seismometry, quirky applications of 166
Selkirkia major 232
serpentinite, Mont Chenaillet 144,*144*,145
SETI Institute, and UCB to build new telescope to search for extraterrestrial intelligence 51
shells, calcareous and phosphatic 231
SHERATON, J.W., Support for the no-diapir model (let.) 14
ships, of the Aral Sea *222,223,224*
shipwreck geology 179
wood tar may have led to reducing conditions for siderite 179
Siberian flood-basalt event 98
Siberian Traps 14,15
siderite cement, on shipwrecks 179
Sidneyia inexpectans 234
Sierra Leone, modern foraminifera 158
Silbury hill, in danger of collapse 122
silcretes 227
well-developed, found only on stable landforms 27
silica toxicity 34
Simosuchus, teeth of 75,76
Sinornithosaurus millenii 139,*139*
sirenians, evolutionary intermediate form, Java 42
skulls
crocodilian 72–4
Dimetrodon, arched 36–7
dinocephalian 37
gorgonopsian 38–9,*38*
modern carnivores 37
slate, at Tate Modern (Richard Long) 198
Slave Craton, sudden jump in electrical conductivity at the Moho 97
'slippin' and slidin'
landslips in Britain 44
melting of permafrost holding Alpine peaks together 44–5
slumps, soft-sediment, Burgess Shale 233
Smilodon, sabre-toothed cat 36
Smith, William
friends of 40
meeting with John Farey 59
received first Wollaston Medal from Geological Society of London 173
stratigraphic succession from London Tertiaries to Red Ground expounded in Farey's *General View* 63
subject of *The Map That Changed The World* 172–4
snow comets, no evidence for found 51
soft sediment layer beneath San Gabriel valley/Los Angeles 45
soil-forming factors 225–6
soil-forming processes 226
Soils, past and present 225–8
climate reconstruction 226–8
grandfathers of modern pedology 225,*225*
interpretation of past volcanism and tectonic events 228
palaeosols 225,226
soil formation 225–6
importance of parent material 225
in tectonically active regions 228
sonar, mapping of Gakkel Ridge volcanoes 138,*139*
South Yemen, fossils found 160
Soviet Union
airborne particulates from smelters 33
irrigation canals from Amudarya and Syrdarya for cotton 219
sphenacodonts 36
sphenosuchians 73,74
Spinosaurus 162
Spinther 117
Spitzbergen, today's glaciers 25
spreading ridges, Atlantic and Pacific types 145
Spriggina floundersi 117,*120*
SSSIs, protection of in Countryside and Rights of Way Bill 168
STANTON, W., going for the hardstuff (let.) 94–5
Steno, use of palaeontological data 148–9
Stenopterygius, streamlined for speed 42,*42*
Stomatosuchus inermis 73,76
Stone Mountain, Atlanta 43
Stonehenge, copy at Longleat 163
subalpina subzone 136
subsidence
due to underground railway construction 16
of Grade II listed buildings though building of Jubilee Line 165
Rome, a risk for many ancient monuments 123
sulphosalts 77
importance of fahlores 79
Sun Bed, with *Diplocraterion* 29,*31*
supergene orebodies, iron-enriched, proximity to many BIFs 142
supernovae, radioactive iron-60 atoms from detected on earth 128
superplumes 20
Sutton Hill Quarry, Bishop Sutton
expansion of quarrying increased potential for fossil finds 29–30
initial collecting controlled by quarrying 29
Svalbard
glacial landform development, understanding of 25
glaciers of 25–6

Swallows Nest, Crimea, vulnerable to earthquakes 4
Synapsida 36
Syrdarya (river)
  old meander loops with cotton fields *219*
  rises in Tien Shan *218*
  supplying irrigation water 219–20
Syringopora, Kilkenny Limestone 174,*200*

Tajikistan
  a possible one off bonus for Large Aral 224
  will want water from Amudarya for industrialization 224
taphonomy 159
Tate Modern as geology 199–200
  London from Roman times onward, restaurant view 200
temperature, rising in the Alps 44
Tenmile Geyser 24
tennantite 78,79
  Tsumeb mines, Namibia 80
terrane analysis 149
'terrible heads' *see* dinocephalians
Tethys suture, Alps 144–5
Tetrahedrite group (Minerals explained) 77–80
  tetrahedrite
    in dolomite 79–80
    name alludes to its morphology 78
    occurs in sediments 79
tetrapods
  slow and awkward movement 20–1
  speedy bolosaurid 21
Thailand, 'raptor' claws, unlikely to be the real thing 57–8
thalattosuchians *73,75*
thermal alteration, and collapse of sections of volcanic edifices 138
therocephalians 36,*36*,*37*
  replaced by gorgonopsians 39
THOMAS, B., Lyme Regis in danger (let.) 95
thrusting, associated with last major ice sheet in Britain 28
Tibetan Plateau 157
Titanosuchus 37
TOKARYK, T.
  Canada: palaeontologist W.G.W. Caldwell honoured 132–3
  News values: the 'behaviour' of careful reporting 211–12
Tomopteris 117
Toompea Hill, Estonia 43
TORRENS, H.S. *see* FORD, T.D.
Totternhoe Stone 40
Townsend, Reverend, and William Smith 40
trace fossils, and behaviour of eurypterids 197–8
transmission electron microscopy (TEM), for individual particle characterization 35
Travels with Fossil Hunters, Peter Whybrow 157–60
  charting past links between Asia and Africa 160
  China, and palaeontological diplomacy 158–9
  early hominids in the Kashmiri Himalaya 159
  Gibraltar 157–8
  Gulf Coast and sabkha crossing 158
  hominoids, western Turkey 159
  India, Cretaceous Corulline Limestone 158
  Niger, fossil-bearing Cretaceous and Tertiary rocks 157
  Old Red Sandstone fish, Latvia 158
  Salt Range mountain, North West Frontier 159
  Seymour Island and James Clark Ross Island 159–60
  Sierra Leone 158
  Tibetan Plateau 157
travertine, Crystal Geyser 24
trees, very old
  Gingko 88
  the Nightcap Oak 88
Treverophyge marokkensis 177,*178*
Triassic–Jurassic boundary, North Mendip 29
Tribrachidium heraldicum 117,*120*
Triceratops horridus, return from restoration and amendment 125
trilobites, from Morocco 177–8
Trondorthis subcircularis 150
Tsarist Russia, annexed Aral Sea with Central Asia 219
Tsumeb mines, Namibia
  azurite and malachite 155
  tennantite 80
tsunamis
  ancient, devastated Britain's east coast 202
  Britain at risk from 202
  from the Oshima-Oshima volcanic eruption 98–9
    explained by total slide volume 100,*100*
  journalistic 206–7
Turkey, western, search for hominoids 159
twinning
  analcime 237
  in the fahlores 79
Tyrannosaurus rex 36
  fanciful reporting 211
  gregarious, Canada 5
  Hell Creek Formation 5
  Sue and Stan 8

U–Pb dating, of zircon in Isua Greenstone Belt 181
UHP rocks *see* metamorphism, ultra-high-pressure
underground railway construction, and subsidence 16
uniformitarianism 142–3
United Kingdom Minerals Yearbook 171–2
universe, computer models of 4(Front Cov),126
Upper Triassic sediments, excavation of vertebrate-bearing horizon, North Mendip 29–32
Ural Mountains, azurite and malachite 155
Uranus, cloud puzzle 51
urban environments, sources of lead in 33
urban renaissance
  how geology can help 11–12
    geological walks in built up areas 11
  town trails 11–12,*12*
USA
  American Geophysical Union, award winners 89
  analcime 238
  cuts at the Smithsonian Institution, indirect effect on Earth science 86
  Los Angeles, lying above deep 'spongy' rock layer 45
  National Academy of Sciences, new Earth Science members 89
  Portuguese Bend Slide, California 95,176
  United Stated Geological Survey (USGS)
    funding cut 124
    increased funding recommended by National Academy of Sciences 3–4
  updating one of world's largest centrifuges 3
  Valles Caldera National Preserve, New Mexico
  Yucca Mountain, high-level nuclear waste depository, Maybe or maybe not 205–6
Uzbekistan
  cannot afford to change its main cash crop (cotton) *222*
  Large Aral a problem of *222*

Valcourea 150
Valles Caldera National Preserve, New Mexico, re-shaped by man 8
Varanosaurus, snout of 37
Vauxia gracilenta 234
Vendozoa 117
Vietnam, Archaean rocks in the Cavinh Complex 214
volcanic activity
  Japan *87*
  successful prediction of in Iceland 87
volcanic ash
  derived soils very fertile *228*
  and Eminem 88
volcanic soils, layered, repeating sequence *228*,*228*
volcanoes
  edifices with collapse potential 138
  as tourist attractions 124
    via *The Independent's* travel section 203
  under the Arctic 138,*139*
  under pyroclastic flows 87–8

wairakite 237
WALTHAM, T.
  Crystal Geyser – Utah's cold one 22–4
  Geotourism: Hinboun River Cave 90–1,*91*,*92*
  landslide protection, Almaty, Kazakhstan 169–70
  Leaning Tower of Pisa – stable at last 131–2
  Pinnacles and barchans in the Egyptian desert 101–4
  SHOLJI, I., The demise of the Aral Sea – an environmental disaster 218–34
  The pinning of Lyme Regis (let.) 175–6
Waptia fieldensis 232
Watson, White 192
  'tablets', improved by acquaintance with Farey 61–2
Wealden anticline section, Farey *60*,61
  extended to the Isle of Wight 61,*62*
weathering, mechanical, Farafra oasis 102
Wenlock Limestone 109
West Runton cliffs, example of glacial thrusting 28
Western Tottori Earthquake 90
What the Papers say 3–7,42–6,83–7,122–5,162–6,202–7
Whirlpool galaxy (M51), Hubble Space Telescope photographs 127,*127*
White Cliffs of Dover
  cliff recession 84
  see also Devil's Chimney, Beachy Head
WHITE, P. Back to Dunkirk (let.) 13
whole-mantle convection cells 19
Wight, Isle of, land slips 44
WILLIAMS, C.T. *see* MILNER, A.C. *et al*
WILLIAMSON, B.J., Mineralogical composition of atmospheric airborne particulates 32–5
Wilmslow Sandstone 213
WILSON, P., and CLARK, R., Unusual events: impacts of possible lightning strike at Burtness Comb, Lake District 213–14
WIMBLEDON, W., Jurassic–Cretaceous boundary (let.) 135–6
Wingate Sandstone 23
WINTERFLOOD, I., French–Italian Alps, the Atlantic-type ophiolite, Mont Chenaillet (Excursion guide 14) 143–8
women in geology, where are they? 110–14
  denied chance to practise geology as paid employment 110
  excelled as popular science authors 111
  for many years *personae non gratae* 110
  Mary Anning 110,111–12
  Mary Morland 112–13
    letter 137
  a supporting role for 111
  the two Marys compared and contrasted 113–14,*114*
  Where are the women in Geology? (let.) 136
    reply 136–7
Woodside Geyser 24

X-ray diffraction, for particle size estimation 34–5
Xiphactinus, fails to be elected US President 44–5

Yilgarn Block
  Algoma-type BIFs
    Goldfields region 140
    Nullagine area 141,*141*
  BIFs of hard to distinguish from those of Hammersley Basin 142
Yorkshire
  archaeological excavation near Whitby Abbey 166
  barnstorming in the Dales 165
  the perils of karst 17–18,*18*
  protecting the coast 165
Yorkshire Coast Fossil Forum 165
Younger Dryas 25
Yucca Mountain, Nevada, site beneath for deposit of high-level nuclear waste 205–6

Zeravshan River, rises in Alau ranges 218
ziphodonts 73
zircons
  dating of in Isua Greenstone Belt 181
  detrital
    indicating presence of early crust and also oceans 95
    Mt Narryer and Jack Hills 96